

IN THE DRAWINGS

The attached sheets of drawings include changes to Figs. 17-19. These sheets, which include Figs. 17-19, replace the original sheets including Figs. 17-19.

Attachment: Replacement Sheets

REMARKS/ARGUMENTS

Favorable reconsideration of this application is respectfully requested.

Claims 1-27 are pending in this application. Claims 1-10, 17, 19-23, 26, and 27 stand withdrawn from consideration. The drawings were objected to under 37 C.F.R. § 1.83(a). The Amendment filed on January 11, 2006, was objected to under 35 U.S.C. § 132(a) as introducing new matter. Claims 11, 12-16, 18, and 24-25 were rejected under 35 U.S.C. § 112, first paragraph. Claims 11, 12-16, 18, and 24-25 were objected to for informalities. Claims 11-12 and 14, 16, and 18 were rejected under 35 U.S.C. § 102(b) as anticipated by U.S. patent 6,101,008 to Popovich. Claims 11, 12-16, and 18 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. patent 6,229,561 to Son et al. (herein "Son"). Claims 11-16 and 18 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. patent 5,966,167 to Nose et al. (herein "Nose"). Claims 24-25 were rejected under 35 U.S.C. § 103(a) as unpatentable over Son as applied to claim 12, and further in view of U.S. patent 6,611,243 to Moseley et al. (herein "Moseley"). Claims 24-25 were rejected under 35 U.S.C. § 103(a) as unpatentable over Nose as applied to claim 12, and further in view of Moseley. Claims 13 and 15 were rejected under 35 U.S.C. § 103(a) as unpatentable over Popovich. Claims 24-25 were rejected under 35 U.S.C. § 103(a) as unpatentable over Popovich in view of Moseley.

Initially applicants and applicants' representative wish to thank Examiner Change for the interview granted applicants' representative on December 6, 2006. During the interview the outstanding rejections were discussed in detail. Further, during the interview proposed drawing changes and claim amendments were discussed to address the outstanding issues in the Office Action. The present response presents the discussed drawing changes and amendments as discussed during the interview. During the interview the Examiner indicated that such amendments may address the outstanding issues but would be further considered in view of a filed response.

Addressing first the objection to the drawings, that objection is traversed by the present response.

Applicants submit the drawings clearly show the claimed "image generator" in cameras C1-C4 in Figures 17 and 19 in the present specification. The Office Action appears to take the position that such disclosure is improper as the elected species is Figure 18 and not Figures 17 and 19. In reply applicants note Figures 17 and 19 are directed to the same embodiment as Figure 18, as is also Figure 20.

Moreover, to even further clarify the drawing replacement Figures 17-19 are submitted herein that now label an image generator IG, and as corresponding to cameras C1-C4. The drawings thus now even more explicitly support the claim language.

Addressing now the objection to the Amendment filed January 11, 2006 as introducing new matter and the related rejection of claims 11, 12-16, 18, and 24-25 under 35 U.S.C. § 112, first paragraph, that objection and rejection are traversed by the present response.

Initially applicants note the claims are amended by the present response to clarify that the allocation of the two or more input images to each of "different" image display regions of an image display device is "in a time dividing manner". That subject matter is fully supported by the original specification at, for example, page 66, line 20 et seq.

As shown in Figure 18 in the present specification, and drawing attention to the corresponding disclosure in the specification at page 66, line 5 et seq., a sub-region (a display region) of the display device is each of the rectangular regions of screen S of Figure 18. Two or more input images (L1 and L2 for example) are allocated to one sub-region, each of the allocated images corresponding to be one of deflected toward different view points. Similarly two images (L3 and L4) and allocated to a different sub-region (an adjacent display region).

That is, the images (for example L1 and L2) allocated to each of the sub-regions are switched at a certain timing. When the number of images assigned to a sub-region is 2 as illustrated in Figure 18, these images are displayed alternately at short time intervals, and guided to two different view points (for example to a right-eye position and a left-eye position) to create a stereoscopic sense in the observer. In the example shown in Figure 18 image L1 for the right-eye and image L2 for the left-eye of an observer are displayed alternately at short time intervals. Because this switching timing is very short, the observer will feel or have an illusion as if the two different images come into the left-eye and the right-eye simultaneously and separately.

Applicants also respectfully submit it is well-known in the art that a left-eye and a right-eye image can cause a stereoscopic sense based on binocular parallax, as discussed in the "Description of the Related Art" section of the specification at page 2, line 12 et seq.

Further, in the operation in Figure 18, a different set of input images is then assigned to a different sub-region (for example an adjacent sub-region) covered by the same unit area (see for example the lenticular element LL). For example, when images L1 and L2 are allocated to a first sub-region, a different image pair L3 and L4 are allocated to the adjacent sub-region belonging to the same unit area. The image data items L3 and L4 are also switched, similarly as discussed above with respect to images L1 and L2, and the light beams from this adjacent sub-region are guided to further different view points in sync with the switching timing.

Further, the images L1 and L2 can be switched by an ordinary switching circuit for supplying the images L1 and L2 alternately to the associated sub-region. The beam from the sub-region can be deflected to different view points using, for example, the structure shown in Figure 18 of a light deflector LC placed in front of a lenticular lens LL, as is clearly

discussed in the present specification, in view of which one of ordinary skill in the art would clearly understand such features.

The above-noted objection to the Amendment filed January 11, 2006 takes the position that “the specification never discloses to have two or more images allocated in a single display region **at one time**” (original emphasis). The above-noted bases for the outstanding rejection appear to take the position that the claims could indicate an allocation “at one time” since the specification and claims do not clarify how the allocation was made.

In reply applicants note the specification is clear that the allocation is in a time dividing manner as noted above, and the claims now even further clarify that feature.

In view of the presently submitted claim amendments and above-noted comments the above-noted objection and rejection are believed to be overcome by the present response.

Addressing now the further rejection of claims 11, 12-16, 18, and 24-25 under 35 U.S.C. § 112, first paragraph, that rejection is traversed by the present response.

The claims are amended by the present response to now further clarify how a stereoscopic image is realized. Specifically, the claims now clarify that the light path of the different light images is deflected towards “respective of the multiple viewpoints synchronized with the switching timing such that the first image from the respective image display region is deflected to a first of the multiple viewpoints at the first timing and the second image from the same respective image display region is deflected to a second of the multiple viewpoints at the second timing”. That subject matter is also believed to be fully supported by the original specification as discussed in the above-noted description of Figure 18 in the present specification.

Claims 11 and 12 were also amended as failing to teach how to “switch” to display one of the images allocated in the same display regions to be displayed.

As discussed above, and again with respect to Figure 18 in the present specification as a non-limiting example, the two images L1 and L2 are alternately displayed, and the light deflector LC and lenticular lens LL in conjunction with controlling the screen S by the image display device DISP can clearly perform such a switching. That feature is also now clarified in the claims. Applicants also do not understand the statement that the claims “fail to teach” how to switch, as one of ordinary skill in the art in reading the specification would understand such a switching operation as recited in the claims, and it is unclear how any claim can “teach” an operation.

Claims 11 and 12 were also rejected as “fail[ing] to teach how could the light deflector is capable of deflecting images from the same display regions to different viewpoints”.

That basis for the outstanding rejection is not at all understood as it is well-known in many devices how an image can be deflected to different view points. That is, the basis for the outstanding rejection appears to somehow or other suggest that an image at one area could not be deflected to different view points. Figure 18 clearly shows a light deflector LC placed in front of a lenticular lens LL. Clearly a light deflector can deflect light to different areas. That is, clearly a light deflector deflects light and does not have to deflect light always to one same area, as would clearly be understood to one of ordinary skill in the art.

Applicants also note the disclosure with respect to Figures 18 and 20 in the present specification clearly indicate the operation of a light deflector, which would clearly be understood to one of ordinary skill in the art.

Addressing now the objection to claims 11, 12-16, 18, and 24-25, those objections are traversed by the present response.

With respect to the objection to the phrase “light image”, that phrase is believed to be proper. First, applicants believe the claim should be read in its entire context. For example

claim 11 recites “light images output from the image display regions”. Applicants understand that light does not have an image, but the claims do not recite light images in the abstract, but recite “light images output from the image display regions”. In that context applicants believe that claim phrase is clear, and is clearer than “image light”.

Addressing now the prior art rejections based on Popovich, Son, and Nose, and each further in view of Moseley, those rejections are traversed by the present response.

Applicants respectfully submit none of the cited art discloses or suggests the claimed operations in which multiple images are displayed in different regions in a spatially-divided manner, and two or more images are switched in each of the spatially-divided image display regions in a time-dividing manner, as recited in the claims. Such claim features are clarified by the presently submitted claim amendments, and applicants submit the outstanding Office Action did not properly consider the claims.

Popovich is directed to an autostereoscopic display system based on electrically switchable holograms. In Popovich the entirety of a first diffused projected image is guided to a first observer at a first time period, and then the entirety of a second diffused projected image is guided to a second observer at a second time period, see for example Popovich at column 7, line 44 et seq., and column 3, lines 25-40.

In such ways Popovich clearly does not disclose or suggest the claimed operation such that two different images from the same image display regions are provided in a time-divided manner, and such that a first image from an image display region is deflected to a first of the multiple viewpoints at a first timing and a second image from the same image display region is deflected to a second of the multiple viewpoints at a second timing.

In Popovich a first image for a first observer is displayed on an entire region of a display device, and then a second image for a second observer is displayed on the entire display device, and then the displayed image is switched as a whole. In contrast to Popovich,

in the claimed invention multiple input images corresponding to multiple view points are generated. The display device is divided into multiple display regions to allocate two or more input images to each of the display regions, and the allocated input images are displayed in a switching manner, while guiding the switched images to different view points.

Again in the example discussed above in Figures 17-20 of the present specification, images L1-L4 for four view points (for three observers) are generated and the respective images are guided to four different view points. Popovich does not disclose any even similar operation. Popovich simply does not disclose or suggest any switching of two or more input images allocated to the same display region of a display device.

In such ways, the claims clearly distinguish over Popovich.

Son merely discloses a three-dimensional image system in which images are output at different timings. Thus, Son discloses a time-dividing operation. However, Son does not disclose any type of separating light images from image display regions from one another, as recited in amended Claims 11 and 12. That is, Son does not disclose any spatial separation. In Son the images output at different timings are guided to a same eye. In contrast, the claims separate the images to different viewpoints. Again with reference to Figure 18 in the present specification as a non-limiting example, different images L1 and L2 output from a stripe in a time dividing manner are guided to different eyes by a deflector, which clearly differs from the disclosure in Son.

In such ways, the claims clearly distinguish over Son.

Nose is directed to a stereoscopic display apparatus in which a variable apex angle prism is used. However, in Nose images deflected by the prism are intended to be guided to a same eye. In that way, the prism in Nose differs from the claimed deflector as the claimed deflector deflects images output from a stripe and separated by a separating element towards different viewpoints. That is, in the claims images output from an image display region are



deflected and separated towards different viewpoints. Nose fails to teach or suggest any such operation.

In such ways, the claims clearly distinguish over Nose.

Moreover, no teachings in Moseley are believed to overcome the above-noted deficiencies of Popovich, Son or Nose.

Further, with respect to the objection as it not being clear what the claims mean by the term “multiple viewpoints” that claim language is even further clarified by amending the claims to recite the multiple viewpoints “including a right-eye position and a left-eye position of a viewer”. Such subject matter is clear from the original specification, see again Figure 18 in the present specification and the description thereto, and is believed to clearly address the above-noted objection.

In maintaining the rejection the outstanding Office Action indicates to review Popovich at column 7, line 55 to column 8, line 28. In reply applicants respectfully submit that disclosure in Popovich is not directed to the claimed features. That disclosure in Popovich is clearly directed to an entirety of each of the stacks 54-56 (or all of the display device) having at one time an image provided to one viewpoint, and then at a second time the entire display region is provided to a second viewpoint.

In contrast to Popovich in the claims each image display device is divided into different image display regions that have different images allocated thereto in a time dividing manner. Popovich clearly does not disclose or suggest such features.

With respect to the teachings in Son, Son also does not disclose or suggest dividing an image display device into different image display regions which have different images allocated thereto in a time dividing manner. Noted Figure 1(a) in Son merely changes the viewpoint for the entire display device but not for individual image display regions.

With respect to the comments citing Nose, Nose is similar to Popovich and Son in that an entire display device has images directed to viewpoints, but Nose also does not disclose or suggest that different individual display regions of an overall display have images allocated in a time dividing manner.

Moreover, none of the disclosures in Popovich, Son, or Nose clarify the operation of the deflecting device as claimed. As noted above the deflecting device now recites:

switching a deflection direction of deflected light in synchronization with the first and second timing of displaying the two or more input images to deflect deflecting a light path of each of the light images emitted from the image separator towards a different respective of the multiple viewpoints synchronized with the switching timing such that a first image from the respective image display region is deflected to a first of the multiple viewpoints at a first timing and a second image from the same respective image display region is deflected to a second of the multiple viewpoints at a second timing.

In view of these foregoing comments, applicants respectfully submit the claims as written clearly distinguish over the applied art.

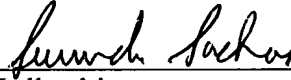
Applicants also note withdrawn claims 19-23, 26, and 27 are pending in this application. Those withdrawn claims all depend directly or indirectly from independent claim 12. Thus, independent claim 12 is generic to each of withdrawn claims 19-23, 26, and 27. As independent claim 12 is believed to be allowable for the reasons discussed above, the reinstatement and allowance of claims 19-23, 26, and 27 is believed to be proper.

Thus, in view of the present response, applicants respectfully submit each of claims 11-27 is in condition for allowance.

As no other issues are pending in this application, it is respectfully submitted that the present application is now in condition for allowance, and it is hereby respectfully requested that this case be passed to issue.

Respectfully submitted,

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